

### Abstract

**[0074]** A radiometric calibration system finds an inverse response function of a camera from a single digital image of a scene in which the actual colors of the scene are not known *a priori*. The system analyzes pixels of the image that correspond to an “edge” between two colors of the scene. These “edge” pixels represent a blended color formed from these two “component” colors, as measured by the camera. The system determines an inverse response function at least in part by: (a) finding suitable edge pixels; and (b) determining a function that maps the measured blended colors of edge pixels and their measured component colors into linear distributions. Reference data that includes predetermined inverse response functions of known cameras can be used in determining an inverse response function via a Bayesian Estimation.